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AUTHOR Harris, Sandra M.; Halpin, Glennelle
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ABSTRACT

The purpose of this study was to investigate the factor structure of a Factors Influencing Pursuit of Higher Education (FIPHE) Questionnaire which addresses factors influencing a person's decision to pursue higher education. Researchers used a literature-based, rational factors approach to develop the questionnaire; the three-part study included a pilot study to assess the internal consistency of the scales (e.g., evaluate mechanical aspects such as grammar, form, content, readability); a second study to validate the questionnaire; and a third study to evaluate the factor structure of the questionnaire. Study participants were students enrolled in general studies classes at two southeastern universities during spring 1997 and fall 1998 semesters. Internal consistencies were evaluated through a reliability analysis. Factor analysis revealed that the hypothesized structure of the questionnaire to be somewhat accurate, with the 9-factor solution as effective as the 10-factor solution in defining the set of variables. The results of the study suggested that the FIPHE questionnaire was a potentially useful instrument for investigating the factors that influence individuals to pursue higher education. (CH)

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Factors Influencing Participation in Higher Education: Exploring the Factor Structure of a Questionnaire

Sandra M. Harris and Glennelle Halpin

Auburn University

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Author Note

Correspondence concerning this article should be addressed to Sandra M. Harris, Ph.D., who is now at the at Counseling, Education, and Psychology Department, Troy State University Montgomery, Building 136, PO Drawer 4419, Montgomery, Alabama 36103. Electronic mail may be sent via Internet to sharris@tsum.edu.

Abstract

This purpose of this study was to investigate the factor structure of the researcher-developed Factors Influencing Pursuit of Higher Education Questionnaire (FIPHE). The sample consisted of 509 participants from two southeastern universities. Reliability estimates for the FIPHE Scales ranged from .66 to .90. Principal axis factoring using varimax rotation was used in the factor analysis. While 10 factors were specified as the extraction criteria, results revealed that a nine-factor solution was as effective in defining the data set. The nine-factor solution accounted for 37% of the common variance, whereas the 10-factor solution accounted for 38% of the variance. The nine-factor solution, with a few exceptions, was consistent with the hypothesized structure of the questionnaire. Results provide evidence that the FIPHE Questionnaire is a potentially useful instrument that can be used to investigate the factors which influence individuals to pursue higher education.

Factors Influencing Pursuit of Higher Education:
Exploring the Factor Structure of a Questionnaire

As countries compete to move to the forefront of technological advancements, obtaining a bachelor's degree will become an essential element for the success of adults in America. "Knowledge has become the key resource, for a nation's military strength as for its economic strength. And this knowledge can only be acquired through schooling" (Drucker, 1995, April, p. 37). The push for an educated work force will mean an increased demand in the number of graduates emerging from the classrooms of American colleges and universities. In a recent meeting of the United Nations Educational, Scientific, and Cultural Organization, educators from more than 180 countries agreed that "More people . . . will need post-secondary education to be professionally and technologically skilled" (Murray, 1999, January, p. 11) workers of the 21st century.

If America is to compete in the social, economic, and political spheres of international relations, then the country must ensure that the work force is provided with the resources needed for meeting the challenges of the 21st century. The very concept of land-grant universities was begun with the idea of fostering the economic security of America. "Economic growth and social prosperity were the overt goals of the nation's leaders in creating the land-grant universities" (Scanlon, 1993, p. 72). From its inception, the goal behind creating public institutions of higher education was to educate individuals for the good not only of themselves but also for society.

Failing to provide an adequate education for American youth is a costly proposition. Consider the fact that across a life span, the average high school dropout loses approximately $230,000 in income. That lost income equates to approximately $69,000 in lost taxes (Eccles,

1997, Renchler, 1990). In addition, earning a college degree increases a person's earning potential by 18% to 45% per year. Over a lifetime, a college degree generates about $41, 400 to $125,500 more in personal income. In turn, this increase in potential income could generate approximately $12,420 to $37, 650 in potential income taxes (Pascarelli & Terenzini, 1991). In sum, it is in America's best interest, financially, to increase its number of college graduates. For educators in particular, this means that they must provide an educated work force that is capable of meeting the demands of the 21st century work place. To do so, the income earning potential of American citizens must be increased by first increasing their educational level.

Theoretical Background

Before educators can increase the number of college graduates, they must first know and understand the factors that motivate a person to pursue higher education. Researchers have identified several variables thought to have an impact on a person's decision to pursue higher education. Some educators assert that the desire to pursue a college education is a form of achievement motivation. Others contend that in order to understand what influences a person to pursue a college degree, one must understand what motivates a person to achieve. The coming section addresses achievement motivation as it relates to pursuing higher education. The topics that will be discussed are the individual, social, cultural, and financial issues that affect achievement motivation.

Individual Characteristics

Motivation is "complex and multidimensional and no doubt interacts with" (Uguroglu & Walberg, 1986, p. 5) a number of social, emotional, and educational constructs. Researchers who

seek to understand achievement motivation must also seek to understand the individual and internal characteristics that are associated with achievement motivation. Two such characteristics are self-efficacy and locus of control.

Self-Efficacy

Bandura (1996) defined self-efficacy as one's beliefs about one's ability to perform specific behaviors. Bandura's research also reveled that self-efficacy is mediated by other motivational forces such as social comparisons. Social comparisons occur when individuals look to similar others to make self-comparisons (Schunk, 1991). From these comparisons individuals make judgements regarding their own competence regarding certain domains of behavior. Positive feedback from others and positive self-appraisals interact to enhance performance. Several researchers (Brown, Lent, & Larkin, 1989; Lent, Brown, & Larkin, 1984; Lent, Larkin, & Brown, 1989; Multon, Brown, & Lent, 1991) have delineated the relationship between self-efficacy, academic performance, academic persistence, and career choices. The major finding of these studies was that self-efficacy, in general, is predictive of performance indicators such as grades, academic persistence, and the number of career options that a person considers.

Locus of Control

Several researchers (Bandura, 1993; Schunk, 1991) have found that self-efficacy is related to anther concept known as locus of control. Locus of control "refers to individually perceived sources of control over certain behaviors or events" (Conger, Conger, & Elder, 1997. p. 250). There are two dimensions along the locus of control spectrum: internal and external. According to recent research (Covington, 1992; Graham, 1994; Strickland, 1989) individuals with an internal

locus of control ascribe their successes and failures to their own efforts and abilities. Conversely, individuals with an external locus of control see both success and failure as being factors beyond their control. Hence, the more internal a person's locus of control, the greater the person's confidence in his or her personal ability to perform certain behaviors (Taylor & Popma, 1990).

Regarding achievement motivation, research by Mickelson (1990) revealed that individuals who possess a high stress internal locus of control are more likely to engage in achievement-related behaviors. Similarly, Gadzella, Williamson, and Ginther (1985) reported that individuals who are high on the external-dimension of locus of control tend to have lower achievement expectations. Taken together, results from research on locus of control leads one to conclude that individuals who pursue higher education tend to be more internal in their locus of control. Hence, the stronger a person's internal locus of control, the higher the person's achievement motivation is likely to be (Mickelson, 1990).

Social Factors

Many researchers have investigated social support as a means of mitigating the effects of stress on college students. The presents a literature review of what previous researchers have said about the impact of social factors such as family background, family support, peer influence, the presence of mentors, and the presence of role models on a person's decision to pursue higher education.

Family Background

The relationship between family background and child development is a complex one, especially when viewing the effect of family background on academic and achievement

motivation. "Poverty, gender, ethnicity, and household composition have all been associated with various indices of school-based competence among American children" (Patterson, Kupersmidt, & Vaden, 1990, p. 485). Data from research has revealed that family background influences adult socioeconomic attainment (Behrman, Rosenzweig, & Taubman, 1994). Among the background variables which affect achievement motivation are factors such as parental involvement, parental income, parental expectations, parental educational level, and parental occupational status.

Parents exert a strong influence over their children's development, especially in the area of occupational and career exploration (Cohen, 1987). Studies by Chavkin and Gonzalez (1995) and Henderson and Berla (1994) revealed that involving parents in their children's education is a sure way to increase students' achievement. In another study, Walberg (1984) found that "family involvement in education was twice as predictive of academic learning as family socioeconomic status" (Chavkin & Gonzalez, 1995, p. 1).

While most researchers report positive effects of parental involvement on student achievement, the relationship between parental involvement and student success is a complicated one that is not easily discernible. One reason for the complexity rests in the fact that researchers have used the term "parental involvement to refer to substantially different types of involvement by parents" (Fehrmann, Keith, & Reimers, 1987, p. 330). While definitions of parental involvement may vary, Epstein (1992) reported that "students at all grade levels do better academic work and have more positive school attitudes, higher aspirations, and other positive behaviors if they have parents who are aware, knowledgeable, and involved" (p. 1141).

Parental income. Lankard (1994) has posited that family income is a factor which has a significant effect on the career development of youth. Wealthier families tend to invest more in their children's physical, emotional, social, and educational well being (Behrman & Taubman, 1990). Consequently, wealthy parents tend to pass on their income earning potential to their children through their greater expenditure of their own personal wealth (Astone & McClanahan, 1991; Axin, Duncan, & Thornton, 1997; Behrman et al., 1994; Mayer, 1997; Patterson et al., 1990). Haberman (1987) and Donnelly (1988) reported that parental income level is the single most important variable which predicts whether a child will attend college. While data from some research (Axin et al., 1997) has shown that economic resources is an important dimension of the number of years of a person's completed schooling, other research has also demonstrated that economic hardship has an adverse effect on academic performance (Conger et al., 1997).

As a social variable, family income is affected by factors such as parental education and parental occupation. These factors, when combined, determine a family's socioeconomic status (SES). A number of researchers have indicated that SES is related to positive achievement outcomes such as educational attainment and occupational status (Haveman & Wolfe, 1995; Majoribanks, 1988; Penick & Jepsen, 1992). "Meta-analytic studies indicate that among traditional indicators of SES, family income is the highest single correlate of academic achievement, followed by parental occupation and parental education" (McLoyd, 1998, p. 192). Data indicate that poor and low SES students have significantly lower academic achievement indicators than their nonpoor counterparts. Moreover, poor and low SES students attain lower scores on achievement tests; they experience higher rates of grade retentions, course failures,

special education placements, and high school dropouts; and they witness lower incidents of high school graduations and completed years of schooling (Conger et al., 1997, Entwisle & Alexander, 1990; Haveman & Wolfe, 1995; Patterson et al., 1990).

Other researchers have suggested that there is an interactive effect between parental involvement and SES. Results from one study (Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987) revealed a significant effect for the level of involvement for mothers in high SES families. The data indicated that mothers in higher SES brackets tend to be more involved with their children. Consequently, one would expect that mothers with high SES have a greater influence on their childrens' decision to pursue higher education than do fathers with high SES.

Much of the research on the effect of parenting on academic achievement has focused on parental involvement with children in primary and secondary schools. By logical extension, however, one would expect that those variables would also have an impact on a child's decision to later pursue higher education.

Parental expectation. Parental expectation has been defined as a parent's "Future aspirations or current expectations for children's academic performance" (Christenson, Rounds, & Gorney, 1992, p. 178). In general, past results have revealed a strong, positive correlation between high academic achievement and high parental expectations (Boersma & Chapman, 1982; Cohen, 1987; Peters & Mullis, 1997; Scott-Jones, 1984; Seginer, 1983, 1986; Thompson, Alexander, & Entwisle, 1988). Seginer (1983) conducted a literature review of studies in which the impact of parental expectations on academic performance was investigated. Data from Seginer's study indicated "that high achieving children tend to come from families who have high expectations for

them" (p. 4). Seginer's results have been further supported in research by Patrikakou (1996) and Singh et al. (1995). These researchers used path analysis to investigate the factors that affect students' achievement motivation. Results from both studies showed that parental expectations have a direct, positive influence on academic achievement. The studies also revealed that parental expectations have an indirect influence on students' academic achievement in that parental expectations influence students' personal expectations for academic success. However, other research suggests that "The relationship between parent expectations and achievement appears to be extremely complex and may involve many mediating variables" (Christenson et al., 1992, p 182).

Parent's background. Parental background variables such as educational level and occupational status have also been shown to have an effect on children's future occupational status and income level. Data from research conducted by Haveman and Wolfe (1995) revealed that parents who obtain educational levels above the mean of the education for a given population will tend to have children who also attain educational levels above the mean. Data reported by Hardy (1993) revealed that individuals have a 70% chance of completing college if both parents are college graduates. If both parents have some college education, but no degree, the likelihood that a person will be a college graduate decreases to 61%, and if both parents have a high school education or less, the likelihood that an individual will be a college graduate drops to 18%.

Several researchers (Haveman & Wolfe, 1995, Thompson et al., 1988) have revealed that mother's educational attainment and occupational status are often the most important predictors of children's school achievement. In an examination of results from the National Longitudinal

Survey of Labor Market Experience of Youth, Peters and Mullis (1997) found that mother's education had the highest effect on school achievement. Other family background characteristics that influence a child's educational attainment are variables such as number of siblings, number of family geographic relocations, religious preferences, and parenting practices (Haveman & Wolfe, 1995; Penick & Jepsen, 1992).

Family Support

The positive effect of family support on student achievement has been well documented (Haveman & Wolfe, 1995; Thompson et al., 1988). However, for some individuals pursuing higher education, that support may not be easy to obtain. Some researchers (Espinosa, 1995; Ortiz, 1995; Renchler, 1990; Rendon & Valadez, 1993) have shown that obtaining family support may be especially problematic for first-generation college students. According to Hsiao (1992), "Parents, siblings, and friends who have no experience of college or its rewards may be non-supportive or even obstructionist" (p. 1) toward the efforts of those who seek a college degree. In another study (Terenzini et al., 1994), first generation college students reported that while their family members initially encouraged and supported their desires to attend college, those same family members began to pressure them to become less active in school activities and become more supportive of family events.

Peer Relations

While researchers have found that parents have the most significant long-term impact on their childrens' future educational plans, other researchers have documented the impact of peer influence on daily school performance. When it comes to academic achievement, peer influence

appears to be a reciprocal relationship (Cohen, 1987). Data by Evans, Oates, and Vaden (1990) revealed that students perform at a higher level if their fellow students are high achievers.

The impact of peers on achievement motivation is not limited to primary and secondary school; it also extends into higher education. Researchers who have investigated the effect of peer influence on a person's transition to college have found mixed results. In one study, Terenzini et al. (1994) conducted a series of focus-group discussions with students who were transitioning either from high school to college or from work to college. Results from the discussions "made clear that high school friends were instrumental in how successfully these new students transitioned to college life" (p. 64). If the transitioning students had high school friends who were attending the same college, those high school friends served as a social buffer and helped to form a bridge that eased the transition period. Conversely, noncollege-bound high school friends tended to complicate the transition process. "Such friends may have functioned as interpersonal anchors, tending to hold the student in the network of friends and patterns of activities and interests of the precollege years" (Terenzini et al., 1994, p. 65).

Role Models and Mentors

Other researchers (Chliwniak, 1997; Haveman & Wolfe, 1995; Howe, 1997; Merisotis, 1990; Russell, 1991; Wolf-Wendel, 1998) point to the presence of role models and mentors as variables which influence individuals to participate in higher education. While both role models and mentors have an impact on individual performance, the two are different concepts. Haveman and Wolfe (1995) defined role models as "adults or peers to whom children or adolescents relate and who set norms of behavior and achievement to which they aspire" (p. 1834). Role modeling is the process

through which individuals come to identify with certain characteristics and behaviors of others. Role modeling is an important source of information by which individuals form perceptions about their future potential. When individuals are unable to witness others like themselves serving in high profile, high prestige occupations, those individuals are not likely to see themselves as occupying those roles. While parents and siblings serve as the primary role models for children, other significant individuals can also fulfill that function. Schunk and Hanson (1985) posited that modeling is a form of social comparison by which children gauge their own competence and abilities. Several studies have found that childrens' acquisition of cognitive skills was positively influenced when the children observed peers performing those tasks (Schunk & Hanson, 1987; Schunk, Hanson, & Cox, 1991). The data further revealed that peer modeling had a much greater effect on subsequent performance than did teacher modeling.

While role models have an impact on a person's self-perceptions through simply providing a good example, mentoring is a more dynamic process. Haney (1997) defined mentoring as a "relationship between an experienced and less experienced person in which the mentor provides guidance, advice, support, and feedback to the protege'" (p. 211). Mentoring is also the process by which experienced individuals facilitate the assimilation of newcomers into an organizational or corporate climate (Bierema, 1996). For example, mentoring can ease the culture shock that first-generation college students face as they transition into the academic setting (Galbraith & Cohen, 1995). In addition, mentoring provides career development, individual growth, and expanded opportunities for individuals, particularly women and minorities, who have traditionally faced organizational barriers to upward mobility (Gunn, 1995). Hence, mentoring is an on-going

process that involves a communication exchange between two individuals. "A mentor's role is to promote intentional learning. That includes developing people's capabilities through instructing, coaching, modeling, advising, as well as providing stretching experiences" (Kaye & Jacobson, 1996, p. 44).

Several studies have documented the relationship between mentoring and academic success. One study by Nicoloff and Forrest (1988) revealed that the lower publication rate among female members of the American College Personnel Association was related to the lack of graduate school mentoring relationships among those female members. In another study, LeCluyse, Tollefson, and Borgers (1985) found a positive relationship between mentoring and the rate of involvement in professional activities for women graduate students. Likewise, research by Cronan-Hillix, Gensheimer, Cronan-Hillix, and Davidson (1986) indicated that psychology graduate students who reported having a mentor evidenced higher grades, engaged in more scholarly research activities, and produced more publications than students who did not have mentors. Additionally, Merriam and Thomas (1986) presented data from interviews in which 19 out of 20 community college presidents attributed part of their success to having had a mentoring relationship in graduate school. When viewed collectively, these data highlight the significant impact of mentoring relationships on the development of the persons being mentored.

Cumulatively, data on the effects of role models and mentors on achievement reveal that the presence of role models and mentors have a positive effect on achievement motivation. The data further suggest that educators must be cognizant of the effect that culture has on the effectiveness

of role modeling and mentoring. The coming section presents a discussion of the cultural determinants which influence achievement motivation.

Cultural Determinants

Culture is defined as "the behavior patterns, beliefs, and all other products of a particular group of people that are passed on from generation to generation" (Santrock, 1997, p. 13). For instance, the belief that males excel in mathematics, science, and technical careers while women excel in arts-related subjects are American cultural beliefs which have been propagated for years (Sanders, 1997). Because culture has such an influential effect on one's beliefs and value systems, one's culture also affects one's beliefs about education. The coming paragraphs present information on how culture shapes a person's beliefs regarding the relative function, the glass ceiling phenomenon, and the perceived value of education.

Relative Functionalism

This concept can be described as the way individuals perceive the function of education in comparison to other noneducational pursuits (Sue & Okazaki, 1990). Sue and Okazaki (1990) used this concept of relative functionalism to explain the ascendance of Asian Americans to the top of the academic success ladder. Statistics on the academic success rate of Asian Americans, as compared to their successes in other areas, lead to an intuitive understanding of the plausibility of the relative functionalism theory (Sue & Okazaki, 1990; Tan, 1994). When looking at other nonacademic opportunities for success, the salience of Asian Americans is few. For example, there are few images of highly successful Asian Americans in areas such as sports, entertainment, politics, and business (Sue & Okazaki, 1990). This phenomenon appears to produce a type of

glass ceiling effect, and subsequently Asian Americans may opt for academics as a means of breaking through that ceiling.

Glass Ceiling Effect

The glass ceiling effect occurs when a person or group of persons perceive the opportunities for success in a particular job or jobs to be blocked (Mickelson, 1990). This concept partly explains why the academic performance of African, Hispanic, and Native American students lags behind that of their Asian and Anglo American counterparts. In turn, the perceived glass ceiling engenders certain minority groups with a sense of hopelessness and despair when it comes to competing in the job market for jobs traditionally held by Anglo Americans (Fordham & Ogbu, 1986). Failing to realize the connection between academic success and later employment, some minority students spend less time and effort on schoolwork than their Asian and Anglo American peers (Steinberg et al., 1992).

Perceived Value of Education

The value a person places on education is in part affected by their expectancies for success. Research by Berndt and Miller (1990) revealed that students who have high expectations for success tend to be more involved in and more successful in academic endeavors. When students do not expect to be rewarded for the efforts, they tend to devalue education (Berndt & Miller, 1990; Dweck & Leggett, 1983). Some research results have also revealed that age affects a person's perception of the value of education. The data revealed that students at higher levels of education tend to place greater value on education (Pascarelli & Terenzini, 1991).

When viewed collectively, the data regarding culture and achievement motivation reveal that culture has a significant impact on a person's motivation and desire to pursue higher education. The data further suggest that there a number of elements in the educational process that conflict with the cultural beliefs and practices of certain groups in the context of education. In turn, those conflicts tend to have an adverse effect on an individual's motivation to achieve.

Educational Process

During the first 20 years of life, the average American child spends approximately 15,000 hours in an academic setting. "Thus schools represent a primary socializing influence that has enormous impact on the course of people's lives and, in turn, on society" (Deci, Vallerand, Pelletier, & Ryan, 1991, p. 325). Because schools reflect the social practices of a given society, not all students receive fair and equitable treatment in school. For instance, research reveals that gender and sex make a difference in both the elementary and the secondary schools in America (American Association of University Women (AAUW), 1995). Although males and females enter the educational process with roughly the same skills and abilities, and in some cases girls out perform males, by the end of the high school girls reportedly score lower on interpersonal measures such as self-concept, self-esteem, and self-efficacy. In addition, females tend to fall behind their male counterparts in academic areas such as science and mathematics (AAUW, 1995; Sanders, 1997).

The next few paragraphs present a discussion of how various elements of the educational process affect children's motivation to achieve. The processes that will be discussed are teacher-student interactions, general preparation for college, and guidance and career counseling.

Teacher and Student Interactions

The classroom environment itself plays a large role in stimulating the motivation to achieve. "The expectations teachers have for their students and the assumptions they make about their potential have a tangible effect on student achievement" (Lumsden, 1997, p. 1). Because students tend to live up to the expectations of their teachers, teachers can foster either an environment of success or an environment of failure (Bamberg, 1994; Harris, Rosenthal, & Snodgrass, 1986; Lumsden, 1997; Raffini, 1993; Schofield, 1997). The largest single factor within the classroom that affects an individual's achievement motivation is the teacher's response to student effort. A study by Scott-Jones and Clark (1986) revealed that teachers respond differently to the school performance of minority and nonminority students. The research revealed that teachers look for and reward achievement-oriented behaviors more often in Anglo American children than in minority children. In addition, teachers tend to have lower expectations and standards for minority students. The research results also showed that teachers gave more praise and reinforcement to Anglo American children labeled as gifted, and teachers exhibited more criticism and scorn toward minorities who were similarly labeled as gifted.

Data from other research has shown that teachers respond differently to children of various social, economic, or ethnic backgrounds (Gonder, 1991). According to McLoyd (1998), "teachers tend to perceive poor and low-SES students less positively . . . and have lower achievement expectations for them than for nonpoor children" (p. 193). In addition, such teachers tend to "provide poor children with less positive attention, fewer learning opportunities . . . and less reinforcement for instances of good performance" (McLoyd, 1998, p. 194). The results from

this research leads one to conclude that minority and poor students are less likely to receive encouragement from their teachers to pursue higher education.

General Preparation for College

Other variables which influence individual participation in higher education are factors such as guidance and career counseling (Donnelley, 1988; Merisotis, 1990) and high school recruiting programs (Donnelley, 1988). Without information on how to take college admissions test, how to fill out college applications, how to follow procedures for filing applications, how to meet application deadlines, and how to obtain information on financial assistance, many students miss out on key information needed for enrolling in college. Left to navigate this enrollment quagmire on their own, many students may give up in frustration and never enter the halls of higher education. Other factors such as tracking (grouping students according to ability), gifted education (providing specialized instruction), and special education programs are other educational processes which leave many students, especially minorities, ill-prepared for the demands of a college education (Howe, 1997).

Guidance and Career Counseling

Guidance and career counseling typically involves providing "services and programs to facilitate individuals' development and their ability to make optimal choices regarding their roles in occupational, familial, and social structures" (Ward, 1995. p. 2). It is a process in which the counselor should be aware of the impact of his or her actions on the decision-making process of those with whom they interact. Because of their positions, secondary school counselors and college admission officers are in prime positions for influencing the career choices of American

youth. In fact, some educators have likened school counselors and college admissions officers to being social engineers (Hoganson, 1996) whose jobs consist of advising young people in matters relating to academic and career choice options. While many schools are replete with excellent school counselors, some of those counselors may hold stereotypical attitudes and beliefs concerning racial and gender-role behaviors (Betz, 1997). Consequently, these attitudes and values may intentionally or unintentionally be passed on to the students.

The compendium of data concerning the effects of education on achievement motivation reveal that elements of the educational process preclude some individuals from either pursuing higher education or from exploring the full range of opportunities afforded by higher education. Yet, even when the educational process is conducive to fostering achievement motivation and an individual is encouraged to pursue higher education, not all who desire to obtain a college degree will succeed in so doing. For some individuals, the lack of financial resources presents another barrier to pursuing higher education.

Availability of Financial Assistance

Probably the one variable with the largest impact on a person's participation in higher education is the availability of financial aid. Since 1976 the availability of financial aid has continually declined. Between 1980 and 1987 federal support of financial aid programs decreased by 11%. Yet the number of students needing financial aid increased by 20% (Donnelley, 1987). Similarly, Carter and Wilson (1993) reported that the 1990-dollar value of the Pell Grant was one fifth of the value it held in 1975. They also reported that the availability of college work-study programs has decreased by 50% since 1971. Not only has financial aid to students decreased over

the years, funding for higher education, in general, has declined. For the 1990-1991 school year, most colleges and universities experienced cutbacks in funds for higher education. To compensate for the funding deficits, many schools increased their tuition rates (Congressional Budget Office, 1992). Those who did witnessed a corresponding drop in enrollment rates the following year

Purpose

There is a strong body of research related to individual, isolated constructs that affect academic achievement and motivation. Yet little has been done to establish the connection between achievement motivation and the pursuit of higher education. Past researchers have done a thorough job of investigating, in an isolated fashion, the individual, social, cultural, and educational variables which affect achievement motivation. While educators are aware of the declining number of individuals graduating from the ranks of higher education, they still are not cognizant of what to do to stabilize, and ultimately increase, those numbers. More research needs to be conducted to gain an understanding of the factors that influence individuals to pursue higher education. Within this framework, educators could design recruitment and retention programs that capitalize on the power of those influences. It is the researchers' intent to develop a questionnaire that further highlights the factors that motivate individuals to pursue higher education.

Taking into account the need for an increased number of college graduates and the aforementioned research, the purpose of this study was to investigate the factor structure of a questionnaire which addresses the factors that influence a person's decision to pursue higher education. The researchers used a literature-based, rational factors approach to develop the Factors Influencing

Pursuit of Higher Education (FIPHE) Questionnaire. The general question at the heart of this study was this: Do the statistical properties of the FIPHE Questionnaire conform to the hypothetical structure of the a priori, 10-factor questionnaire? The specific objectives of this study were to (a) assess the internal consistency of the scales contained in the FIPHE Questionnaire, (b) evaluate the statistical properties of items assigned to scales in the questionnaire, and (c) evaluate the factor structure of the FIPHE Questionnaire.

With information gained from this study, educators could design college orientation and recruitment programs which take this information into account. Such programs could be structured to address all factors which influence individuals to pursue a college education, instead of just one or two in isolation of the others. Data obtained from this study could result in designing programs which approach college recruitment from a multifactorial perspective and thus improve the potential success of such programs. The strength of using this approach is that it could provide quantitative data on what is important in terms of attracting people into higher education.

Method

The researchers developed the FIPHE Questionnaire by using a literature-based, rational factors approach. Items in the questionnaire gathered information on variables thought to have an impact on a person's decision to pursue higher education. Validation of the FIPHE Questionnaire has occurred over the course of three studies. During the first study, the Pilot Study, the FIPHE Questionnaire was evaluated for mechanical properties such as grammar, form, readability, clarity of items, etc. The content validity of the questionnaire was also assessed. The second study was a

validation study which further assessed, using a larger sample, the statistical properties of questionnaire. The third study, Exploratory Factor Analysis, assessed the degree to which the factor structure of the questionnaire, as determined by factor analysis, held consistent with the a priori, researched-based scales designated by the author. The coming paragraphs provide details of those studies.

Study 1: Pilot Study

The purpose of this study was multi-fold. The first objective was to evaluate the mechanical aspects (grammar, form, content, readability, etc.) of the questionnaire. The second objective was to assess the content validity of the questionnaire. Content validity refers to the extent to which an instrument contains a sampling of the items from the area of interest (American Psychological Association, 1985; Fink & Kosecoff, 1985). According to Ary et al. (1996), an instrument is judged to have content validity if "evidence is gathered by careful and critical examination by expert judges of the test to determine the relationship between the test and the defined universe" (p. 163). The face validity of the questionnaire was also assessed during the pilot study. Face validity refers to the how well an instrument appears to measures what it is supposed to measure (Ary, Jacobs, & Razavieh, 1996; Groth-Marnat, 1990; Marble, 1997). For more details regarding the Pilot Study, the reader is referred to Harris (1998, 1999).

Participants

Participants were individuals who were enrolled in college classes at several southeastern universities during the 1996 summer quarter. Participants were recruited through their personal contact with the researcher. The single requirement for participating in the study was that the

participant be enrolled as an undergraduate in college at the time of completing the questionnaire. A total of 21 individuals ($N = 21$) participated in the pilot study.

Procedures

Participants were given the questionnaires on an individual basis. Participants were instructed to fill out the questionnaire and write notes concerning items that were poorly worded, ambiguous, or confusing. As each participant returned a questionnaire, the researcher conducted a face-to-face interview regarding the content, appearance, and readability of the questionnaire.

Instrument

The questionnaire consisted of two items. Section 1, the demographic section, contained eight items that solicited information on the participants' age, student status, name of university, ethnicity, gender, college major, number of hours worked the week prior to completing the questionnaire, and annual income. Because several of the demographic items were considered sensitive items, participants responded to those items by selecting responses from a range of values rather than by selecting a single value. Research by Fink and Kosecoff (1985) indicated that responding to a range of values for such items makes them appear less personal.

Section 2 of the questionnaire consisted of nine scales. The scales consisted of 107 closed-ended statements which addressed factors thought to have an impact on a person's decision to pursue higher education. The closed-ended statements were chosen (a) "because they have proven themselves to be more efficient and ultimately more reliable" (Fink & Kosecoff, 1985, p. 26) and (b) because they place respondents in the same frame of reference for responding to items on the questionnaire (Ary et al., 1996). To minimize the possibility of response bias (Salant & Dillman,

1994), the questionnaire contained both positively and negatively worded items. Participants used a Likert-type scale to indicate their level of agreement or disagreement with each statement. For details on the scoring procedures used in this study, the reader is referred to Harris (1998, 1999).

Design and Statistical Analyses

Because the researcher's main purpose was to develop a questionnaire that was internally consistent, a reliability analysis was performed on the data. Cronbach's coefficient alpha was used to measure the internal consistency of the scales included in the questionnaire. According to Westhuis and Thayer (1989), coefficient alpha is the best measure of reliability because it "provides a good estimate of the major source of measurement error, sets the upper limits of reliability, [and] provides the most stable estimate of reliability" (p. 157).

While any test developer hopes to obtain a reliability coefficient that approaches 1.0, such a value is rarely obtained in behavioral or social science research. However, Thorndike (1957) has provided general guidelines for assessing the reliability estimate of a scale. Thorndike suggested that reliability estimates of .40 to .50 are sufficient for describing groups. Similarly, Mehrens and Lehman (1984) suggested that the adequacy of a measure's reliability depends upon the intended use of the measure. Measures which are used to make decisions about individuals should be more reliable than those which are used to make decisions about groups.

In addition to assessing the internal consistency of the scales, an item-analysis was performed on individual items. This analysis provided information on the internal consistency of single items as they related to the homogeneity of items contained in a scale (Norusis, 1993; Thorndike, 1967). The item analysis was conducted by investigating the item-total correlation for

each item in a scale. Items with a correlation of .25 or higher were retained for inclusion in subsequent analytic procedures. This value was chosen because it represents the critical value of r with alpha set at .01 and df = 100 (Ary et al., 1996). Items with lower correlations were excluded from subsequent statistical procedures, if excluding the items did not decrease alpha of the scale to which the items were assigned. In addition, items with correlations less than .25 were considered for either modification or removal from the questionnaire (Ary et al. , 1996; Thorndike, 1967).

Results and Discussion

Most of the participants (n = 15) in this study were nontraditional college students. The most frequently occurring age range (n = 10) was 36-40 years. Three participants were fifth-year students, one was a fourth-year student, four were seeking bachelor's degrees, four were seeking master's degrees, and two were seeking doctoral degrees. The racial composition was 10 African Americans, 10 Caucasians, and 1 person of Hispanic descent. Eight of the participants were males and 13 were females. Table 1 presents a summary of the descriptive statistics for the nine scales. Results from the reliability analysis revealed internal consistency estimates which ranged from moderate to high (.53 to .90).

Results from the pilot study revealed that the FIPHE Questionnaire is a potentially construct valid instrument for gathering information on the factors that influence a person to pursue higher education. As a result of the pilot study, a number of revisions were made to the questionnaire. A summary of those revisions can be found in Harris (1998, 1999).

Table 1

Pilot Study Table of Summary of Descriptive Statistics for the Scales Contained in the FIPHE Questionnaire

Scale	n[a]	M[b]	SD[b]	M[c]	SD	Alpha[d]
Locus of Control Scale	13	5.76	.78	74.90	8.53	.85
Parental Support Scale	11	4.40	.87	48.43	14.06	.90
Family Support Scale	10	4.13	.72	41.33	11.52	.84
Peer Influence Scale	15	5.10	.42	76.48	15.09	.90
Relative Functionalism Scale	10	5.13	1.04	51.33	6.01	.62
Glass Ceiling Effect Scale	4	3.88	1.08	15.52	2.96	.53
Presence of Role Models/Mentors Scale	16	4.63	.88	74.00	15.19	.90
Preparation for College Scale	19	3.81	1.06	72.43	14.41	.85
Financial Aid Concerns Scale	9	3.94	1.21	35.43	6.71	.54

Note. N = 21 for all items

[a]n denotes number of items. [b]Denotes descriptive statistics for item means. [c]Denotes descriptive statistics. [d]Denotes alpha after poorly performing items were excluded from the reliability analysis.

Study 2: Validating the Questionnaire

After revisions were made to the questionnaire, a second study was conducted. The purpose of the second study was to further assess the statistical properties of the FIPHE Questionnaire.

Participants

Participants were college students enrolled in general studies classes at two southeastern universities during the 1997 spring quarter. A total of 650 questionnaires were distributed among the two campuses. Four hundred and eighty-seven questionnaires were returned for a response rate of 75% for both colleges. Fifty-three of the returned questionnaires (8%) were not used in data calculations because of missing or unusable information. College 1 was a large, traditional land-grant university. Participants from this university were 296 undergraduate students enrolled in three sections of a social science course. College 2 was a smaller, nontraditional college. Participants from College 2 were 96 undergraduate students enrolled in six sections of an introductory psychology course.

Procedures

Participants were recruited through the course instructors. Each instructor read an announcement which detailed the requirements for the study. Participants completed the questionnaires at home and completed questionnaires were returned either to the instructors or to a place designated by the researcher. The questionnaires were coded to maintain the confidentiality of the participants. Each participant signed an informed consent statement. Participants were granted extra credit for returning completed questionnaires. Each instructor

determined the amount of extra credit granted for participating in the study. Participants were also given the opportunity to enter their names into a drawing for $75.00.

Instrument

The questionnaire consisted of 10 demographic items, 95 closed-ended statements that were divided among 9 scales, 20 yes or no items, and one open-response item. Section 1, the demographic section, contained 10 items that solicited information on the participants' age, student status, number of years in college, highest degree held, name of university, ethnicity, gender, college major, employment status, number of hours worked the week prior to completing the questionnaire, and annual income. Section 2 of the questionnaire consisted of nine scales that contained closed-ended statements which addressed factors thought to have an impact on a person's decision to pursue higher education. Participants used a Likert-type scale to indicate their level of agreement or disagreement with each statement. For details on the instrument scoring method used in this study, the reader is referred to Harris (1998, 1999).

Design and Statistical Analyses

Cronbach's coefficient alpha was used to measure the internal consistency of the scales included in the questionnaire. An item-analysis was performed on the individual items. Items with a correlation of .25 or higher were retained in the scale. Items with lower correlations were either modified or removed from the scale if doing so did not decrease alpha for the scale to which the items were assigned (Ary, Jacobs, & Razavieh, 1996; Thorndike, 1967).

Results and Discussion

Of the total number of participants, 59 % were female and 41% were male. The most frequently occurring age of the respondents was 20 years or less (n = 289), and 4% of the participants were 35 years of age or older (n = 17). The ethnic composition of the sample was 79% White (n = 311), 16% African American (n = 64), 2% Hispanic (n = 8), 1% Asian (n = 5), and 1% (n = 4) other. Forty-two percent of the respondents indicated that they were employed, and 58% indicated that they were not employed.

Fifty-nine percent of the respondents indicated that they had not worked during the week prior to taking the questionnaire (n = 231); 7% worked between 1 and 10 hours (n = 28); 11% worked between 11 and 20 hours (n = 43); 6 % worked between 21 and 30 hours (n = 24); and 17% worked 31 hours or more (n = 66). Ninety-seven percent of the participants did not have a college degree (n = 379); 1% had an associate's degree (n = 5); 1% had a bachelor's degree (n = 5); and 1% held other types of degrees (n = 3). Sixty-seven percent of the participants indicated that they had been in college for 1 year (n = 264). Two percent of the respondents indicated that they had been in college for more than 4 years. As for annual income, 81% of the respondents indicated that their annual income was less than $10,000 annually (n = 316); 6% reported an annual income between $10,000 and $14,999 (n = 24); and 4% reported an annual income between $15,000 and $19,999 (n = 17). Four percent of the participants reported an annual income of between $20,000 and $24,999 (n = 15), and 5% of the respondents reported that they had an annual income that was greater than $25,00. The largest number of participants (n = 83) reported business as their major. The fewest number of participants (n = 1) reported

forestry as a major. Eighteen participants did not list a major, and 18 participants indicated that they were undecided on their choice of college major. Table 2 presents a summary of the descriptive statistics for the scales.

Results from the validation study were used to make several modifications to the FIPHE Questionnaire. The number of items in Section 1 was increased to 33. Six new items were added to the scale, and seven items were moved from Section 2 of the questionnaire that was used in the pilot study. In addition, several items were adapted from the College Freshman Survey: Demographics (Halpin & Halpin, 1996). The demographic section of the revised questionnaire consisted of 33 items. The 33 items addressed the participants' major, state of high school graduation, age, year in college, race/ethnicity, gender, student status, employment status, average number of hours worked per week, personal annual income, highest degree expectations, parental composition of household, mother's educational attainment, mother's occupational status, mother's degree expectation, father's educational attainment, father's occupational status, father's degree expectation, parents' annual income, ACT composite score, SAT total score, high school grade point average, college grade point average, source of financial aid, racial composition of high school, religious preference, presence of documented disability, number of brothers, number of brothers who are college graduates, number of sisters, number of sisters who are college graduates, number of grandparents who are college graduates, number of friends who are college graduates, and number of relatives who are college graduates.

Table 2

Validation Study Summary of Descriptive Statistics From the FIPHE Questionnaire Scales

Scale	n[a]	M[b]	SD[b]	M[c]	SD[c]	Alpha[d]
Locus of Control Scale	15	2.94	.64	44.07	4.29	.81
Parental Support Scale	12	3.71	.14	4.46	5.64	.87
Family Support Scale	12	3.20	.17	38.34	4.97	.82
Peer Influence Scale	12	3.25	.14	38.96	4.79	.78
Relative Functionalism Scale	13	3.13	.46	4.66	4.62	.81
Glass Ceiling Effect Scale	7	1.94	.41	13.61	2.91	.69
Presence of Role Models Scale	7	2.17	.41	15.20	1.50	.54
Presence of Mentors Scale	11	3.08	1.09	33.85	5.94	.90
Preparation for College Scale	15	2.66	.33	47.92	3.09	.63
Financial Aid Concerns Scale	8	2.60	.98	2.20	2.74	.64

Note. N = 392 for all items

[a]n denotes number of items for the scale. [b]Denotes descriptive statistics for item means. [c]Denotes descriptive statistics for the scale. [d]Denotes alpha after poorly performing items were removed from the scale.

One scale, the Self-Efficacy Scale, was added to the questionnaire. This scale was a nine-item scale that measured a person's perceived competence in a specific area (Bandura, 1993)--the respondent's choice of college major. Items in this scale addressed the student's reason for choosing a specific major and his or her perceived likelihood of success in that major after graduating from college. The number of items in the Locus of Control Scale was decreased to 13. Several items were added to the Parental Support Scale; thus increasing the number of items in the scale to 20. The Family Support Scale was decreased to 11 items. The number of items in the Peer Influence Scale was reduced to 11. The number of items in the Relative Functionalism Scale was decreased to 10. The number of items in the Glass Ceiling Effect Scale was decreased to 7.

The Presence of Role Models Scale was completely revised. First, all items were moved to the demographic section of the revised questionnaire. The revised scale was designed to provide an index of the number of significant others (such as family members and friends) in the participants' lives who could serve as role models for pursuing higher education. The name of the scale was also changed to Presence of Role Models Index. In addition, the name of the Presence of Mentors Scale was changed to Secondary School Support Scale.

A review of the item analysis resulted in some extensive changes for the Preparation for College Scale. First, all items that had a corrected-item correlation of less than .25 were removed from the scale, if removing the item did not decrease coefficient alpha for the scale. Upon reviewing the questions that had been removed from the scale, the researcher observed that the scale actually measured two constructs--secondary school support for college and general college support. This observation prompted the researcher to divide this scale into two scales. One scale

retained the name of Preparation for College Scale. This scale was composed of 11items. The remaining items were dropped from the questionnaire. Finally, the number of items in the Financial Aid Concerns Scale was increased to nine. For additional information on the revisions made to the FIPHE questionnaire, the reader is referred to Harris (1998, 1999).

Study 3: Exploring the Factor Structure of a Questionnaire

The purpose of this study was to assess the degree to which the statistically generated factor structure of the questionnaire, as determined by factor analysis, held consistent with the a priori, literature-based scales.

Participants

Participants were college students enrolled in general studies classes at two southeastern universities during the 1998 fall quarter. College 1 was a large, traditional land-grant university. Participants from this university were 346 undergraduate students enrolled in three sections of a social science course and several sections of an educational psychology course. College 2 was a smaller, nontraditional college. Participants from College 2 were 163 undergraduate students enrolled in six sections of an introductory psychology course. A total of 725 questionnaires were distributed. Five hundred and fourteen questionnaires were returned for a response rate of 71%. Five questionnaires were not used in data calculations because of too much missing information ($N = 509$).

Procedures

Participants were recruited through the course instructors. Each instructor read an announcement which detailed the requirements for the study. Participants were given the

questionnaires to complete at home. Participants returned completed questionnaires either to their instructors or to a place designated by the researcher. The questionnaires were coded to maintain the confidentiality of the participants. Each participant signed an informed consent statement. Participants were granted extra credit for returning completed questionnaires. Each instructor determined the amount of extra credit granted for participating in the study. Participants were also given the opportunity to enter their names into a drawing for $75.00.

Instrument

Participants recorded their responses on the literature-based, researcher-developed Factors Influencing Pursuit of Higher Education Questionnaire (FIPHE), revised version. The questionnaire consisted of multiple-choice, fill-in-the-blank, and true/false type items. The FIPHE questionnaire also collected data on the presence of role models and mentors in the lives of the participants. Those variables were not evaluated in this study. The major data collection portion of the questionnaire contained 10 scales. A list of the statements contained in each scale is presented in Appendix B.

Self-Efficacy Scale. Measured a person's perceived competence in a specific area (Bandura, 1993)--the respondent's choice of college major. Items in this scale addressed the student's reason for choosing a specific major and his or her perceived likelihood of success in that major after graduating from college. This scale was not part of the original questionnaire; it was added after the validation study.

Locus of Control Scale. This scale assessed a person's perceived locus of control as it relates to pursuing higher education. Locus of control addresses how individuals interpret the causal factors associated with their successes and failures (Chapman & Boersma, 1979).

Parental Support Scale. This scale gathered information on the degree to which parents influence a child's decision to pursue higher education. Several researchers have suggested that variables such as parental income (Donnelley, 1988; Haberman, 1987) and parental expectations (Seginer, 1983) have a significant impact on children's academic success.

Family Support Scale. This scale assessed the degree to which family members, other than parents, influence a person's decision to pursue higher education. A study by Jay and Augelli (1993) revealed that the level of family support is a strong predictor of college retention among college freshmen.

Peer Influence Scale. This scale assessed the degree to which peers influence a person's decision to pursue higher education. While some researchers (Steinberg et al., 1992) have found that parents have the most significant long-term impact on their children's educational plans for the future, other researchers (Fordham & Ogbu, 1986) have documented the impact of peer influence on daily school performance.

Relative Functionalism Scale. Relative functionalism was defined by Sue and Okazaki (1990) as the way individuals perceive the function of education in comparison to other noneducational pursuits. This scale assessed a person's perception of the relative function of pursuing higher education.

Glass Ceiling Effect Scale. This scale assessed the degree to which individuals perceive their opportunities to pursue certain aspirations to be limited or blocked (Mickelson, 1990). The scale contained statements that addressed the degree to which the participants perceived their opportunities for success in college to be limited.

Secondary School Support Scale. This scale measured the degree to which individuals received adequate support from secondary school personnel such as teachers and guidance counselors.

Preparation for College Scale. Researchers have indicated that factors such as guidance and career counseling, high school recruiting programs and the availability of information on the college application process have a strong impact on a person's preparation for college (Donnelley, 1988; Merisotis, 1992). This scale assessed a person's general preparation for college.

Financial Aid Concern Scale. This scale addressed the importance of financial aid for a person's pursuit of higher education. Research indicates that in spite of rising inflation costs and the shrinking value of the dollar, the availability of financial aid has not kept pace with changing economic times (Carter & Wilson, 1993; Donnelly, 1987).

Scoring the Instrument

Participants completed the instrument by marking their responses on a scantron form. Scores for each scale were obtained by summing the item responses for each of the scales. The values for the items were coded as follows: (a) scoring for items in Section 2 were coded as strongly agree = 4, agree = 3, disagree = 2, strongly disagree = 1. Scoring for items in Section 3 were coded as T (true)= 4 and F (false) = 3. Negatively worded items were reversed coded before the scale scores

were computed. Instructions for the FIPHE Questionnaire stated that if an item did not apply to a respondent, the respondent was to leave it blank. Blank items were coded as missing data. This approach was taken because some of the items may not pertain to all respondents. For instance, participants who do not have sisters or brothers would not expected to respond to the items which pertain to sisters or brothers. Instead, the more appropriate reply would be not applicable. Incomplete or multiple responses to items were also recorded as missing data. The missing data were handled through the means imputation procedure. Imputation is defined as "the estimation of a missing value and the subsequent use of that estimate in statistical analyses" (Allison & Gorman, 1993, p. 85). Item means were inserted for items that were missing data.

The method of assigning either an item mean or a scale mean for missing data maximized the amount of data collected and minimized the effects of missing data. The strategy of replacing missing data with a constant is supported by Cohen and Cohen (1983). They advocated that the practice of filling in missing data with a constant, the mean of an item or a scale, results in losing the smallest amount of information and statistical power. The mean imputation procedure is a conservative approach to handling the occurrence of missing data (Allison & Gorman, 1993). Because of the experimental nature of the research, a moderate amount of conservatism was justified and the mean imputation procedure for handling missing data was the best approach to take. Also, assigning either an item mean or a scale mean to the missing and N/A responses, in essence, had minimal effect on the statistical properties of either the respective item or scale.

Design and Statistical Analyses

Crosstabulation. A cross tabulation procedure was used to calculate the chi-square values. Chi-square was used to evaluate the frequency distribution of the demographic variables. The chi-square statistic was used to determine whether there were significant gender differences in the observed and expected responses on the demographic variables (Kachigan, 1986).

Reliability analysis. The reliability analysis assessed the internal consistency of the scales included in the questionnaire; it measured the degree to which the items in a scale measured a unitary construct (Hair, Anderson, Tatham & Black, 1995; Pedhazur & Schmelkin, 1991).

Item analysis. The item analysis provided information on the internal consistency of single items as they related to the homogeneity of the scale to which they were assigned (Thorndike, 1967). Items with a correlation of .25 or higher were retained in the questionnaire. Items with lower correlations were either modified or removed (Ary et al., 1996; Thorndike, 1967), if removing the item did not decrease alpha for the scale.

Factor analysis. An exploratory factor analysis was performed to determine the degree to which the data conformed to the literature-based factors established by the author (Hair et al, 1995). As a first step, the correlation matrix was examined to determine whether or not the factor analytic technique was appropriate for the obtained data set. In keeping with suggestions from recent literature (Fabrigar, Wegener, MacCallum, & Strahan, 1999) the researchers considered five methodological issues when making the decision to use exploratory factor analysis. Those issues were (a) the appropriateness of using EFA for the given research; (b) the number of variables to include, in conjunction with the nature and size of the sample to be investigated; (c)

the specific EFA procedure to use; (d) how many factors to include in the model; and (e) the specific method of rotation to use to derive a final factor solution (Fabrigar et al., 1999; Finch & West, 1997).

To address the issue of the appropriateness of using EFA for the current study, the researchers, considered three things. First, the researchers considered whether the purpose of using EFA was consistent with the goal of the current study. The primary purpose for using EFA is to arrive at a more parsimonious explanation for a set of measured variables (Fabrigar et al., 1999). The goal of the current research was to determine whether the statistical properties of the questionnaire were consistent with the a priori, hypothesized structure of the questionnaire. The researchers concluded, therefore, that statistically, the use of EFA was appropriate for the current study. Second, the researchers used the Bartlett Test of Sphericity to determine if the correlations between items in the questionnaire were sufficient for the factor analytic technique (Hair et al., 1995). The Bartlett Test generated a chi-square statistic ($df = 4851$, $N = 509$) that was statistically significant at $p < .01$; thus indicating significant correlations among items in the questionnaire. Third, the researchers used an additional statistical measure, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy, to determine the sufficiency of intercorrelations among items. The obtained KMO of .84 indicated that the degree of intercorrelations among the questionnaire items were suitable for subjecting the data to the factor analysis (Hair et al., 1995).

Recommendations from a number of researchers was used to judge the adequacy of the number of variables included in the study. For instance, "Research suggests that EFA procedures provide more accurate results when each common factor is represented by multiple measured

variables in the analysis" (Fabrigar et al., 1999, p. 273). Other researchers (MacCallum, Widaman, Zhang, & Hong, 1999) contend that an "an important issue affecting the quality of factor analysis solutions is the degree of overdetermination of the common factors. . . the degree to which each factor is clearly represented by a sufficient number of variables" (p. 89). Conventional practice has recommended that the number of variables to factor ratio, p:r, be at least 3 to1 (Fabrigar et al., 1999; MacCallum et al., 1999; Vellicer & Fava, 1998). Results show that highly overdetermined factors (factors represented by 3 to 5 variables) produce the most stable factor patterns (Comrey & Lee, 1992; Fabrigar et al., 1999; MacCallum et al., 1999). Because the p:r of the a priori scales constructed by the researchers exceeded the conventional recommendation, the number of variables included in the study were deemed adequate for performing EFA.

To address the issue of sample size, the researchers considered a number of criteria. As a general rule, Comrey (1973) suggested that a sample of 300 is good. Kass and Tinsley (1979) further proposed a rule of 5 to 10 subjects per variable, up to a total of 300 subjects, for each variable being investigated.

> As the sample increases in size, however, random errors of measurement tend to cancel each other, the item or test parameters begin to cancel, and it becomes less important to add to the sample. Thus, for samples above 300, the relation of items to number of subjects becomes less important (Tinsley & Tinsley, 1987).

In addition, researchers Arrindell and van der Ende (1985) investigated the stability of factor scores for two specific factor analytic procedures: principle-components and principle-factors analyses. They evaluated the stability of factor scores as a function of the ratio of the number of

subjects to the number of variables under investigation. In their study, Arrindell and van der Ende administered the 76-item Fear Survey Schedule to 1,104 participants. Upon evaluating the stability of factor scores based on the number of responses per item, they found stable factor scores that ranged from as few as 1.3 responses per item for a sample of 100 subjects, up to 14.5 responses per item for a sample size of 1,014. Arrindell and van der Ende also conducted a study using the 20-item Fear Questionnaire. In this study, they found factor score stability at a ratio of 3.9 responses per item for a sample size of 78. Consequently, the results of Arrindell and van der Ende's research suggests a measure of flexibility in determining the number of subjects required for conducting factor analysis (Tinsley & Tinsley, 1987).

Still other researchers suggest that traditional guidelines for determining the minimum sample size for factor analytic procedures are not sensitive to characteristics of the data set (Comrey & Lee, 1992; Fabrigar et al., 1999; MacCallum et al., 1999). Results from research conducted by MacCallum et al. (1999) revealed that overdetermination (the number of variables per factor, preferably 5 or more) and the level of communalities interact with sample size to effect the obtained results. Their data showed that in the presence of highly overdetermined factors and high communalities (averaging .70 or higher), sample size had minimum effect on the stability of obtained factor patterns. Considering the findings from previous research (Comrey, 1973; Ardinell & van der Ende, 1985; Tinsley, 1987) the researchers judged the sample size of $\underline{N} = 509$ to be adequate for using factor analysis.

The researchers chose the principal axis factoring method as the EFA procedure for this study. This procedure was chosen for two reasons: (a) it enabled the researchers to analyze the

common variance (the amount of variance an item shared with the other items in a scale) and (b) it allowed the researchers to investigate the hypothesized factor structure of the FIPHE questionnaire (Tinsley & Tinsley, 1987). Principle axis factoring "is the preferred exploratory-descriptive method of factor extraction when analysis of common variance is desired" (Tinsley & Tinsley, 1987, p. 418). This factor analytic method also revealed the proportion of total variance accounted for by each factor.

The varimax procedure was used to obtain the rotated factor matrix. Rotating the factor matrix simplified the factor structure of the questionnaire and made the results easier to interpret (Hair et al., 1995). This procedure allowed the researchers to "describe . . . the covariance relationships among many variables in terms of a few underlying, but unobservable random quantities called factors, or latent variables" (Johnson & Wichern, 1992, p. 396). "The varimax procedure is a method of orthogonal rotation which simplifies the factor structure by maximizing the variance of a column of the factor matrix" (Marble, 1997, p. 103). The factor patterns were then analyzed to determine how each variable loaded on the factors. With a sample size of almost 300 subjects, the traditional approach has been to consider meaningful factor loadings as those values that equal or exceed $\pm$ .30; such values indicate that at least 9% of the variance between the variable and the factor overlap (Tabachnik & Fidell, 1983). However, the Burt-Banks formula (Burt, 1952) suggests that smaller factor loadings may be interpreted as meaningful. The Burt-Banks formula considers the number of variables, the sample size, the number of factors retained, and the confidence level selected by the researcher in determining meaningful factor loadings.

Because of the experimental nature of the current study, the researcher acted on the liberal side of data interpretation and chose to consider factor loadings of ± .25 as being significant loadings.

Results

The chi-square statistic indicated that there were significant differences in the observed and expected frequencies for all of the demographic items. A summary table of the obtained Chi-square values are presented in Table 3, thus indicating a fairly heterogeneous sample.

Reliability and item analyses. The internal consistencies of the scales in the FIPHE Questionnaire were evaluated through a reliability analysis. Table 4 presents a summary of the results from the reliability analysis as well as a summary of the descriptive statistics for each of the scales. The statistical properties of each item were evaluated through an item analysis. An item was excluded from subsequent statistical procedures if it obtained an item-total correlation of less than .25 and removing it did not reduce alpha for the scale. One item from the Self-Efficacy Scale, Item 93, was excluded because it was negatively correlated with scale. Two items were excluded from the Locus of Control Scale. Item 96 was excluded because it was negatively correlated and Item 110 was excluded because of its low correlation with the scale. One item, Item 94, was excluded from the Peer Influence Scale. One item, Item 97, was excluded from the Relative Functionalism Scale. Item 86 was excluded from the Glass Ceiling Effect Scale because of its low correlation with the other items, and Item 95, was excluded from the Secondary School Support Scale. Three items (137, 142, and 147) were excluded from the General Preparation for College Scale because of low corrected item-total correlations. Items 135 and 139 were excluded from the Financial Aid Concerns Scale because of low correlations.

Table 3

Chi-Square Statistics for Demographic Variables

Variable	df	Chi-square
Age	3	56.39
Aptitude test score A (ACT)	4	73.23
Aptitude test score B (SAT)	3	64.13
College major	7	134.18
Degree expectation A (personal)	4	32.80
Degree expectation B (father's)	4	65.12
Degree expectation C (mother's)	4	45.41
Documented disability	1	5.21
Employment status	1	60.77
Employed number of hours weekly	4	211.13
Ethnicity/race	2	111.51
Financial sources for college expenses	8	123.77
Grade point average A (college)	5	49.63
Grade point average B (high school)	5	103.46
Number of brothers	4	29.73
Number of brothers who are college graduates	3	10.45
Number of friends who are college graduates	5	39.00
Number of grandparents who are college graduates	4	62.67
Number of other relatives who are college graduates	5	43.65
Number of sisters	5	33.45
Number of sisters who are college graduates	3	33.69
Parents education A (father's)	4	114.53
Parents education B (mother's)	5	81.31
Parent's income	4	99.89
Parents in the home	5	101.43
Parent's occupation (father's)	5	91.98
Parent's occupation (mother's)	5	46.23
Personal income	5	101.43
Racial composition of high school graduated from	5	153.60
Religious preference	5	48.83
Year in college	3	158.96

Note. All Chi-square values were significant at $p < .03$.

Table 4

Exploratory Factor Analysis Study: Table of Summary Descriptive Statistics for Scales

Scale	n[a]	M[b]	SD[b]	M[c]	SD[c]	Alpha[d]
Self-Efficacy Scale	9	3.27	.57	29.42	3.17	.79
Locus of Control Scale	13	3.23	.52	42.05	4.67	.79
Parental Support Scale	20	3.26	.44	65.23	9.12	.88
Family Support Scale	11	3.23	.33	35.55	4.60	.75
Peer Influence Scale	11	3.23	.58	35.53	4.08	.77
Relative Functionalism Scale	10	3.38	.42	33.82	4.35	.87
Glass Ceiling Effect Scale	6	1.74	.20	1.42	2.90	.66
Secondary School Support Scale	11	2.83	.53	31.10	6.38	.89
Preparation for College Scale	12	3.23	.32	38.79	2.65	.67
Financial Aid Concern Scale	9	2.72	.58	24.48	4.12	.66

Note. N = 509 for all scales.

[a]n denotes number of items for the scale. [b]Denotes descriptive statistics for item means. [c]Denotes descriptive statistics for the scale.

Factor analysis. An analysis of the rotated factor matrix revealed that the initial 10 factors specified in the criteria for the procedure accounted for 38% of the common variance of the rotated factor loadings. Upon further review, the researchers found that a nine-factor solution accounted for 37% of the variance in the rotated factor matrix. Because the 10th factor was difficult to interpret, the researchers chose the nine-factor solution. Results from the rotated factor matrix are presented in Table 5.

Factor 1 of the rotated matrix was named the Family Influence Factor. This factor consisted of a combination of items from the a priori Parental Support and Family Influence Scales. Factor loadings for Factor 1 ranged from a low of .25 for Item 59 to a high of .74 for Item 34. Factor 2 of the rotated matrix was identified as the Secondary School Support Scale. All items from the original scale loaded on this scale. In addition, Items 140, and 141 loaded highly on this scale. The researchers chose to retain these two on the Secondary School Support Scale. Factor loadings ranged from a low of .44 for Item 141 to a high of .71 for Item 122. Factor 3 of the rotated matrix was identified as the Self-Appraisal Scale. Two of the a priori scales converged on this scale. All items from the Locus of Control and Self-Efficacy Scales merged on this factor. Factor loadings ranged from a low of .27 for Item 128 to a high of .65 for Item 102. Factor 4 of the rotated matrix was identified as the Relative Functionalism Scale. All items from the original scale loaded significantly on this scale. Factor loadings ranged from a low of .48 for Item 73 to a high of .73 for Item 77.

Table 5

Results From the Rotated Factor Matrix

Factor 1		Factor 2		Factor 3		Factor 4		Factor 5		Factor 6		Factor 7		Factor 8		Factor 9	
Item	Load	Item	Load	Item	Load	Item	Load	Item	Load	Item	Load	Item	Load	Item	Load	Item	Load
34	.74	122	.71	102	.65	77	.71	70	.73	58	.63	143	.78	133	.62	83	.34
48	.67	123	.70	130	.62	81	.70	71	.70	51	.63	144	.76	124	.57	85	.32
35	.66	115	.68	103	.61	76	.68	72	.61	54	.57	146	.58	126	.47	84	.27
39	.62	117	.65	107	.58	80	.68	69	.48			148	.33	134	.40	82	.27
36	.61	120	.65	131	.58	78	.62	63	.42			145	.33	127	.35		
37	.58	121	.61	105	.57	79	.60	68	.36					136	.33		
49	.56	114	.59	104	.53	75	.57							125	.33		
38	.54	119	.59	129	.48	73	.56										
45	.52	116	.54	106	.48	74	.54										

(table continues)

Factor 1		Factor 2		Factor 3		Factor 4		Factor 5		Factor 6		Factor 7		Factor 8		Factor 9	
Item	Load	Item	Load	Item	Load	Item	Load	Item	Load	Item	Load	Item	Load	Item	Load	Item	Load
41	.52	118	.52	113	.48												
43	.51	140	.45	100	.45												
45	.50	141	.44	99	.44												
47	.47			101	.41												
55	.47			98	.40												
40	.47			109	.40												
44	.42			92	.38												
53	.39			108	.38												
112	.36			92	.37												
57	.36			89	.37												
42	.36			128	.26												

(table continues)

Factor 1		Factor 2		Factor 3		Factor 4		Factor 5		Factor 6		Factor 7		Factor 8		Factor 9	
Item	Load	Item	Load	Item	Load	Item	Load	Item	Load	Item	Load	Item	Load	Item	Load	Item	Load
61	.36																
60	.33																
91	.30																
90	.29																
50	.28																
111	.28																
59	.25																

Factor 5 of the rotated matrix was identified as the Peer Influence Scale. Of the 10 items entered into the factor analysis for this scale, six items loaded significantly on this factor. Factor loadings on Factor 5 ranged from a low of .36 for Item 68 to a high of .73 for Item 70. Factor 6 of the rotated matrix was identified as the Sister's Influence Scale. This scale was not identified in the original questionnaire; it emerged as a result of the factor analytic procedure. Items 51, 54, and 58 were included in this factor. Factor loadings for the three items ranged from a low of .59 for Item 54 to a high of .63 for Item 54. Factor 7 of the rotated matrix was identified as the Preparation for College Scale. All items entered into the factor analysis loaded significantly on this scale. Factor loadings on Factor 7 ranged from a low of .32 for Item 145 to a high of .76 for Item 143. Factor 8 of the rotated matrix was identified as the Financial Aid Concerns Scale. All items that were entered into the factor analysis loaded significantly on this scale. Factor loadings on this scale ranged from a low of .33 for Item 125 to a high of .62 for Item 133. Factor 9 of the rotated matrix was identified as Glass Ceiling Effect Scale. Four of the five items from that were entered into the factor analysis loaded significantly on this scale. Factor loadings on this scale ranged from a low of .29 for Item 84 to a high of .34 for Item 83.

Table 6 presents the descriptive statistics and coefficient alpha for the refined scales. Table 6 also presents statistics for two subscales--Mother's and Fathers Influence Subscales. These subscales did not emerge as separate factors; however, the researchers believe that they are factors which should be investigated separately.

Table 6

Table of Summary Descriptive Statistics for Refined Scales

Scale	n[a]	M[b]	SD[b]	M[c]	SD[c]	Alpha[d]
Self-Efficacy Scale	8	3.45	.17	27.63	3.23	.79
Locus of Control Scale	10	3.40	.22	34.10	4.12	.79
Family Influence Scale	28	3.23	.37	91.81	11.58	.90
Peer Influence Scale	6	3.48	.22	20.85	2.79	.77
Relative Functionalism Scale	9	3.50	.20	31.54	4.50	.87
Glass Ceiling Effect Scale	5	1.73	.22	8.64	2.58	.66
Secondary School Support Scale	12	3.06	.38	36.68	6.72	.89
Preparation for College Scale	6	3.14	.03	18.82	1.35	.68
Financial Aid Concern Scale	7	2.65	.56	18.56	3.87	.66
Sister's Influence Scale	3	3.22	.40	9.65	2.00	.81
Mother's Influence Subscale	10	3.36	.40	33.60	4.61	.81
Father's Influence Subscale	10	3.16	.48	31.62	5.64	.84

Note. N = 509 for all scales.

[a]n denotes number of items for the scale. [b]Denotes descriptive statistics for item means. [c]Denotes descriptive statistics for the scale. [d]Denotes alpha after poorly performing items were excluded from the reliability analysis.

Discussion

With a few exceptions, the results of this study support the a priori, researcher-hypothesized structure of the FIPHE Questionnaire. The results from data obtained in this study were used to make further refinements to the questionnaire. First, results from the reliability and item analyses resulted in 14 items being excluded from further statistical procedures. Removing poorly performing items increased the reliability of the scales to which they were assigned and thus improved the internal consistency of those scales. Optimizing reliability estimates is a prime concern in EFA because poor reliability estimates could result in low communality estimates which, in turn, could distort the results of EFA procedures (Fabrigar et al., 1999; MacCallum et al., 1999; Velicer & Fava, 1998).

Results from the factor analysis revealed that, statistically and with a few exceptions, the hypothesized structure of the questionnaire was somewhat accurate as confirmed by results from the rotated factor matrix. There were, however, some alterations in the structure of the. First, the researchers hypothesized a 10-factor solution for the variables included in the questionnaire. The factor analysis revealed that a 9-factor solution was as effective as the 10-factor solution in defining the set of variables. The 9-factor solution accounted for 37% of the common variance in the data set whereas the 10-factor solution accounted for 38% of the variance. To achieve a degree of parsimony, the researchers opted for the nine-factor solution. Second, data from the factor analysis resulted in six additional items being excluded from the questionnaire because those items did not load on their hypothesized scale.

Third, some of the a priori scales merged and loaded on one factor. Two such scales were the Parental and Family Support Scales. This factor was named the Family Influence Scale. Although

originally hypothesized as separate scales, it is logical that the scales would merge. While it is theoretically sound to study the variables assigned to these scales as a unitary construct, it is also plausible to separate the variables into subscales. If a researcher is interested in understanding how various family members contribute to a person's decision to pursue higher education, the researchers advocate the use of subscales. Two such subscales are the Mother's and Father's Influence Subscales. Using these subscales allows a researcher to invest the influence of mothers and fathers independently instead of collectively. Such an approach would be more practical when studying individuals who come from single parent homes. A second instance of two scales merging onto one factor was the merging of the Self-efficacy and Locus of Control Scales. Because both constructs are forms of self-appraisal, it is not suprising that the scales combined to form one factor. The researchers caution though that the two are separate constructs and should be evaluated as such.

A surprising outcome of the factor analysis was the emergence of a factor that could be identified as a Sister's Influence Scale. The three items in this scale achieved somewhat high factor loadings. In addition, a post hoc reliability analysis revealed a moderately high coefficient alpha (.81) for the scale. The researchers did not anticipate the emergence of this scale. Nothing in the literature supported the emergence of these items as a separate scale. However, the three items measure a unitary construct and the scale to which they are assigned is a reliable measure. The researchers propose, however, that sister`s influence should be evaluated as a subscale of Family Influence Scale. It is possible that the large number of females in the study could have affected the results. It is possible that in a more balanced sample of males and females that this factor would not emerge as a separate scale. However, the influence of sister`s represents an area of future research

Implications and Conclusions

Based on the data from this study, the FIPHE can be considered statistically sound. The reliability estimates for the questionnaire scales indicate that each measures a unitary construct. In addition, results from the factor analysis, with a few exceptions, tentatively uphold the hypothetical structure of the questionnaire. Results from the factor analysis must, however, be interpreted with caution. The demographic data from this study reveals the limited extent of the study's external validity (Pedhazur & Schmelkin, 1991). The researchers further suggest that the scale scores be used to make comparative judgements concerning different populations.

The outcome of this study could be used to provide educators with empirical knowledge of the factors which influence individuals to pursue higher education. The results can move educators beyond dialectical theory of what those factors are to a quantitative index of the relative importance of the factors which influence the decision that individuals make to pursue higher education. The results from this study could also be used to develop strategies for conducting future research with different populations.

As a follow-up study, the survey could be modified slightly and administered to high school juniors and seniors. The aim of this subsequent research would be to determine which factors influence the decision of high school students to attend college and whether or not those factors differentiate between college- and noncollege-bound high school students. Taken from a wider perspective, this survey could be used to conduct a multicultural study of the factors which influence the decision to pursue higher education. Data from such a study would reveal whether or not there are cultural differences in the factors which influence individuals to pursue a college education. Once

again, such research would give educators a quantitative index of what those factors are and how those factors differ across the races.

With information gained from this study, educators could design college orientation and recruitment programs which take this information into account. These programs could then be structured to address all factors which influence an individual's decision to pursue higher education, rather than just one or two in isolation of the others. Data from this study could result in recruitment programs which address college recruitment form a multifactorial perspective; thereby, possibly improving the success of such programs.

The outcome of this research could also have potential implications for economists and politicians alike. When educators talk about educating college students, they talk indirectly about the economic future of this country. For America, this means that if the country is to be able to compete in the social, economic, and political spheres of international relations, then national leaders must ensure that the work force is provided with the resources they need to meet the challenges of the upcoming century. For educators in particular, this means that we must provide an educated work force which is capable of meeting the demands of the 21st century work place. To do this, we must increase the income earning potential of Americans by first increasing their educational level.

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Appendix B
Demographics Data of Participants for College 1 and College 2

Demographic Variable	College 1		College 2	
	n	%	n	%
Age				
20 or less	173	50.0	80	49.1
21-25	157	45.4	41	25.2
26-30	8	2.3	14	8.6
31and over	8	2.3	28	17.2
Aptitude test score A (ACT)				
20 or less	71	2.5	59	36.2
21-25	145	41.9	35	21.5
26-30	73	21.1	8	4.9
31 or >	21	6.1	5	3.2
No response	35	1.1	39	23.9
Aptitude test score B (SAT)				
850 or less	12	3.5	30	8.4
851-1150	87	25.1	18	11.7
1151or greater	80	23.1	10	6.1
No response	167	48.3	105	64.4
Major				
Business	33	9.5	41	25.2
Education	130	37.6	12	7.4
Nursing	7	2.0	35	21.5
Science/Math	27	7.8	10	6.1
Undecided	5	1.4	15	9.2
Other	140	45.0	43	26.4
No response	4	1.2	7	4.3
Degree expectation A (personal)				
None at this time	3	.9	5	3.1
Associate	4	1.2	14	8.6
Bachelor's	82	23.7	16	34.4
Master's	181	52.3	68	41.7
Doctorate	74	21.4	4	11.7
Other (no response, none at this time)	5	1.4	6	3.7

Demographic Variable	College 1		College 2	
	n	%	n	%
Degree expectation B (father's)				
Associate	12	3.5	11	6.7
Bachelor's	126	36.4	37	22.7
Master's	114	32.9	28	17.2
Doctorate	51	14.7	18	11.0
Other (no response, none at this time)	43	12.4	69	42.3
Degree expectation C (mother's)				
Associate	9	2.6	19	11.7
Bachelor's	131	37.9	41	25.2
Master's	115	33.2	33	2.2
Doctorate	44	12.7	19	11.7
Other (no response, none at this time)	48	13.8	51	31.3
Presence of a documented disability				
Yes	47	13.6	10	6.1
No	294	85.0	149	91.4
No response	5	1.0	4	8
Employment status				
Employed	153	44.2	132	81.0
Unemployed	188	54.3	31	19.0
Employed for how many hours weekly				
10 or less	61	17.6	5	3.1
11-20	80	23.1	23	14.1
21-30	18	5.2	16	9.8
31 or more	18	5.2	98	6.1
No response	169	48.8	21	12.9
Ethnicity/Race				
African American	27	7.8	78	47.9
Caucasian	310	89.6	81	49.7
Other (no response, Asian, Hispanic)	9	2.6	4	2.4

Demographic Variable	College 1		College 2	
	n	%	n	%
Financial support for college				
Employer support	4	1.2	7	4.3
Family	173	55.0	25	15.3
Scholarship	20	5.8	12	7.4
Self	7	14.9	40	85.1
Self/family	40	11.6	5	3.1
Self/student loans	16	4.6	8	4.9
Student loans	57	16.5	50	3.7
Other	22	6.4	8	5.9
No response	7	2.0	8	4.9
Gender				
Male	97	28.0	35	21.5
Female	245	71.8	126	77.3
Grade point average A (college)				
<2.00	15	4.3	6	3.7
2.00-2.49	41	11.8	29	17.8
2.50-2.99	80	23.1	44	27.0
3.00-3.49	111	32.1	40	24.5
3.50 or >	89	25.7	16	9.8
No response	10	2.9	28	17.2
Grade point average B (high school)				
<2.00	6	1.7	0	0
2.49-2.00	15	4.3	25	15.4
2.99-2.50	47	13.6	62	38.0
3.49 - 3.00	123	35.5	56	34.4
3.5 or >	154	44.5	14	8.6
No response	1	3	6	3.7

Demographic Variable	College 1		College 2	
	n	%	n	%
Number of brothers				
0	118	34.1	46	28.4
1	141	4.9	49	3.2
2	63	18.3	30	18.5
3	12	3.5	23	14.2
4 or more	11	3.2	14	8.6
Number of brothers who are college graduates				
0	162	46.8	101	62.0
1	52	15.0	16	9.8
2 or more	12	3.5	5	3.0
No response	120	34.7	41	25.2
Number of sisters				
0	125	36.1	35	21.5
1	138	39.9	59	36.2
2	50	14.5	33	25.5
3	14	4.0	19	11.7
4	8	2.3	15	9.2
No response	11	15.5	2	1.2
Number of sisters who are college graduates				
0	137	39.6	102	62.6
1	62	17.9	31	19.0
2 or more	18	7.8	8	5.5
No response	217	6.6	141	39.4
Number of friends who are college graduates				
0	37	1.7	32	19.6
1-10	142	41.0	88	54.0
11-20	52	15.0	14	8.6
21-30	30	8.7	3	1.8
31 or >	60	18.7	7	4.9
No response	25	7.2	19	11.7

Demographic Variable	College 1		College 2	
	n	%	n	%
Number of grandparents who are college graduates				
0	155	44.8	119	73.0
1	56	16.2	11	6.7
2	62	17.9	11	6.7
3 or more	62	17.9	5	3.1
No response	11	3.2	17	1.4
Number of relatives who are college graduates				
0	19	5.8	18	13.2
1-10	187	57.0	95	69.9
11-20	82	25.0	20	14.7
21-30	8	2.4	3	2.2
31 or >	32	9.2	0	0
Parent's educational level A (father's)				
Less than high school graduate	7	.2	25	15.3
High school graduate	36	1.4	46	28.2
Some college	65	18.8	41	25.2
College graduate	113	32.7	38	23.3
Graduate school	125	36.1	7	4.3
No response	0	0	6	1.2
Parent's educational level (mother's)				
Less than high school graduate	9	2.6	23	14.1
High school graduate	57	16.5	54	33.1
Some college	81	23.4	50	3.7
College graduate	118	34.1	29	17.8
Graduate school	81	23.4	5	3.1
No response	0	.0	2	1.2
Parent's income				
$24,999 or less	12	3.5	32	19.6
$25K - $39,999	26	7.5	21	12.9
$40K - $54,999	55	15.9	44	27.0
$55K or >	243	70.2	45	27.6
No response	10	2.9	21	12.9

Demographic Variable	College 1		College 2	
	n	%	n	%
Parents in the home				
Mother/Father	252	72.8	46	28.2
Mother/Step father	24	6.9	19	11.7
Father/Step mother	7	2.0	3	1.8
Mother	29	8.4	31	19.2
Other	15	4.3	32	19.6
No response	16	5.5	32	19.6
Parent's occupation A (father's)				
Unemployed	6	1.7	14	8.6
Unskilled work	5	1.4	12	7.4
Skilled worker	40	11.6	56	34.4
Business/Industry	124	35.8	43	26.4
Professional	170	49.1	32	19.6
No response	1	.3	6	3.7
Parent's occupation B (mother's)				
Unemployed	63	18.2	23	14.1
Unskilled work	11	3.2	23	14.1
Skilled work	44	12.7	33	2.2
Business/Industry	87	25.1	50	3.7
Professional	138	39.9	29	17.8
No response	1	.3	6	3.7
Personal income				
0	13	3.8	2	1.2
$1 - $4,999	96	27.7	24	14.7
$5K - $9,999	37	1.7	22	13.5
$10K - $14,999	21	6.1	42	25.8
$15K or more	9	2.6	49	3.1
no response	170	49.1	24	14.7

Demographic Variable	College 1		College 2	
	n	%	n	%
Racial composition of high school				
Predominantly White	224	64.7	69	42.3
Predominantly Black	19	5.5	39	23.9
Racially balanced	96	27.7	49	3.1
Other	5	1.4	3	1.8
No response	2	.4	3	6
Religious preference				
Baptist	108	31.2	80	49.1
Catholic	43	12.4	14	8.6
Episcopal	19	5.5	4	2.5
Lutheran	3	.9	0	0
Methodist	81	23.4	17	1.4
Presbyterian	26	7.5	3	1.8
Christian not listed	31	9.0	24	14.7
NonChristian	2	.6	1	.6
No preference	28	8.1	13	8.0
Year in college				
Freshman	55	15.9	112	68.7
Sophomore	65	18.8	30	18.4
Junior	94	27.2	14	8.6
Senior or above	132	36.5	7	4.3

Appendix B

Table B1

Self-Efficacy Scale

Item Number	
89	I chose my college major because I am good at it.
92	I chose my college major because I like the subject matter.
93	I chose my college major because it is an easy way to earn a degree.*
98	I chose my college major because I find the work challenging.
99	I chose my college major because I find the work satisfying.
100	I picked my college major because I find it interesting.
128	I was a good student in high school.
129	I consider myself a good college student.
130	I believe that I will be successful in my college major.
131	I feel that I will be successful in my future career.

Table B2

Locus of Control Scale

Item	Number
96	My college advisor helped me choose my college major.*
101	I can major in any college subject that I want.
102	I have the power to achieve my educational goals.
103	If I become unhappy with my life, I can do something to change it.
104	When bad things happen, I can make the best of the situation.
105	Good things that happen in my life are the result of my working to make them happen.
106	Each person controls his or her own fate.
107	Each person has the power to make life better or worse.
108	I have no control of my future. **(R)**
109	No matter how hard I work, I won't succeed at anything I do. **(R)**
110	My college grades reflect how much time I spend studying.*
113	I can be successful in any college major that I choose.

Note. Throughout this appendix, asterisks denote items that were excluded from subsequent statistical procedures. The annotation **(R)** indicates items that are reverse coded.

Table B3

Parental Influence Scale

Item	Statement
34	My father encouraged me to go to college.
35	My mother encouraged me to go to college.
36	My mother is excited about me being in college.
37	My father is excited about me being in college.
38	My mother did not stress the importance of having a college education. **(R)**
39	My father stressed the importance of having a college education.
40	My mother told me about the demands I would face in college.
41	My father did not tell me about the demands I would face in college. **(R)**
42	I can talk to my mother about my college experiences.
43	I can talk to my father about my college experiences.
44	I can talk to my mother about my career goals for after college.
45	I cannot talk to my father about my career goals for after college. **(R)**
46	My father expects me to earn good grades in college.
47	My mother expects me to earn good grades in college.
48	My father was a good role model for influencing me to go to college.
49	My mother was a good role model for influencing me to go to college.
90	My father influenced my choice of college majors.
91	My mother encouraged me to pursue my college major.
111	I am going to college to make my mother proud of me.
112	I am going to college to make my father proud of me

Table B4
Extended Family Scale

Item	Statement
50	My grandparents tried to discourage me from going to college. **(R)**
51	My sister(s) encouraged me to go to college.
52	My relatives (cousins, aunts, uncles) tried to discourage me from going to college.* **(R)**
53	My brother is excited about me being in college.
54	My sister is excited about me being in college.
55	My other relatives stressed the importance of having a college education.
57	My grandparents are aware of the demands I face in college.
58	My sister is aware of the demands I face in college
59	My brother is aware of the demands I face in college.
60	My other relatives are not aware of the demands of college. **(R)**
61	I can talk to my grandparents about my college educational plans.

Table B5

Peer Influence Scale

Item	Statement
62	My friends encouraged me to go to college.*
63	My friends don't understand the demands I face in college. **(R)**
64	My friends think that having a college degree is important for me to get a good paying job.*
65	My friends believe a college education will improve my social status.*
66	I communicate with my high school friends about my college experiences.*
68	I find it easy to make friends in the college setting.
69	I have not met any new friends during the time I have been in college. **(R)**
70	I can not talk to my friends about my college experiences. **(R)**
71	I can not talk to my friends about my career goals after college. **(R)**
72	I do not have a college student friend who I can talk to about my college educational plans. **(R)**
94	My friends talked me into choosing my college major.*

Table B6

Relative Functionalism Scale

Item	Statement
73	Getting a college degree will help me improve my social status.
74	Getting a college degree will help me get a better job.
75	I can gain a lot of knowledge about this world by getting a college degree.
76	I can meet professional people by getting a college degree.
77	Getting a college degree will make me more successful.
78	College graduates routinely get the best jobs.
79	Getting a college degree is important for my future job opportunities.
80	Getting a college degree will improve my self-esteem.
81	Getting a college degree will improve my self-pride.
97	I chose my college major because I can make a lot of money after I graduate from college and go to work.*

Table B7

Glass Ceiling Effect Scale

Item	Number
82	My race does not limit my choice of college majors. **(R)**
83	My gender does not limit my choice of college majors. **(R)**
84	Society limits my choice of college majors.
85	My professors cannot limit my choice of college majors. **(R)**
86	My high school GPA limited my choice of college majors. *
87	The university administrators cannot limit my choice of college majors. **(R)** *

Table B8

Secondary School Support Scale

Item	Number
95	My high school guidance counselor helped me chose my college major. *
114	My high school teachers encouraged me to go to college.
115	My high school guidance counselor encouraged me to go to college.
116	My junior high school teachers did not encourage me to go to college. **(R)**
117	My junior high school guidance counselor encouraged me to go to college.
118	My high school teachers did not talked about the importance of having a college degree. **(R)**
119	My high school guidance counselor did not stress the importance of having a college degree. **(R)**
120	My junior high school guidance counselor stressed the importance of having a college degree.
121	My high school teachers talked about the demands I face in college.
122	My junior high school teachers talked about the demands of college.
123	My junior high guidance counselor told me of the demands of college.

Table B9

Financial Aid Concerns Scale

Item	Statement
124	I sometimes worry about paying my college tuition bill.
125	Without financial aid, I can still get a college degree.
126	I am knowledgeable of the various types of Financial Aid Programs.
127	My parents sometimes worry about paying my tuition bill.
133	The availability of financial aid was an important factor in my decision to go to college.
134	I am not likely to need financial aid in the future.
135	If I need financial aid to help pay for my tuition, I am not sure that I will be able to get it. **(R)** *
136	I know where to go to find information on Financial Aid Programs
139	I received information about financial aid during high school.*

Table B10

Preparation for College Scale

Item	Number
132	The study habits I developed in high school adequately prepared me for my course workload in college.*
137	I used tutors to help me study in high school.*
138	I used tutors to help me study in junior high school.*
140	My high school held briefings on the college application process.
141	I attended briefings on the college application process during high school.
142	I took advanced placement courses in high school.*
143	I took remedial education courses in high school.
144	I took remedial education courses in junior high school.
145	I was part of a regular study group in high school.
146	I took remedial college courses as a college freshman.
147	I took college prep courses in high school.*
148	I was part of a regular study group in junior high school.